

Occurrence of *Yamautidius* (Coleoptera, Trechinae) in the
Upper Hypogean Zone of Southwestern Shikoku,
Southwest Japan

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Abstract Two new species of the trechine genus *Yamautidius* are described for the first time from the upper hypogean zone of southwestern Shikoku, Southwest Japan. Both seem to belong to the *uozumii* complex of the group of *Y. latipennis*, and are readily distinguished from *Y. uozumii* and from each other by peculiarities of the aedeagal apical lobe and of the copulatory sclerite. The new names given are *Yamautidius* (s. str.) *croson* and *Y. sucmo*.

Twenty-four species of small delicate trechine beetles belonging to the genus *Yamautidius* have been known up to the present only from limestone caves and mine adits in the western part of the Island of Shikoku, Southwest Japan (cf. UÉNO, 1957, 1960, 1978, 1982, 1990). They are classified into two subgenera, *Yamautidius* (s. str.) and *Miyamaidius* (UÉNO, 1978), and the members of the former are arranged into nine complexes of three species-groups (cf. UÉNO, 1982, pp. 59–61, 1990). Occurrence of upper hypogean populations has long been anticipated, but our expectation has not been fulfilled until the last spring. Another expectation unfulfilled is clarification of south-westward extension of the generic range; the previously marked southern limit of distribution is Arinoki-no-kanaudo Mine in Tôwa-mura, located at the northern side of the upper main course of the Shimanto-gawa River, which is inhabited by *Y. uozumii* S. UÉNO (1982, pp. 13, 30, figs. 24–26; cf. No. 8 on fig. 55, in UÉNO, 1982, p. 63). Towards the southwest of Tôwa-mura, there is a fairly wide area dominated by the Uwa Hills, surrounded by the middle course of the Shimanto-gawa River and its main tributary, the Yoshino-gawa on the east and northeast, by the Nakasuji Depression on the south, and by the Bungo Channel on the west. No anophthalmic trechine beetles were found in this area before, mainly because of the absence of natural caves and of the prevalence of

granitic ground not favourable for the existence of upper hypogean trechines.

In May of this year, the second author of the present paper made two trips to southwestern Shikoku and succeeded in finding out three new localities of *Yamautidius* at the southeastern side of the Uwa Hills to the west of the middle course of the Shimanto-gawa River. At each locality, anophthalmic trechines were dug out from the upper hypogean zone, and the generic range was extended southwestwards for more than 30 km in a beeline, so that both the long-pending problems mentioned above were clarified by this discovery. After a close examination, it became apparent that the specimens obtained were classified into two new species of the *uozumii* complex of the *latipennis* group. They will be described in the present paper under the names *Y. croson* and *Y. sucmo*. The abbreviations used are the same as those explained on p. 7 of UÉNO's 1982 paper.

Yamautidius (s. str.) *croson* S. UÉNO et NAITÔ, sp. nov.

(Figs. 1-3)

Length: 3.35-3.60 mm (from apical margin of clypeus to apices of elytra).

Related to *Y. uozumii* and identical with the latter in the characteristic conformation of the basal parts of elytra, but a little larger and more dark-coloured, with anteriorly enlarged prothorax and obviously ampler elytra. Definitely different from *Y. uozumii* in configuration of male genitalia, particularly of copulatory sclerite.

Colour reddish brown, shiny, with infuscated head and pronotum; clypeus, labrum, palpi, antennae, venter of hind body, and legs paler than elytra. Microsculpture fine, distinctly impressed on head and partially degenerated on pronotum, mostly consisting of transverse meshes, largely obliterated on elytra though perceptible here and there as fine transverse lines.

Head fairly large, similar to that of *Y. uozumii*; antennae relatively long, reaching apical two-fifths of elytra in ♂, with pedicel about a half as long as antennomere 3 or 4, each of which is nearly 3.5 times as long as wide, antennomeres 8-10 each subcylindrical and nearly three times as long as wide, terminal antennomere about as long as antennomere 3 and obviously longer than scape.

Pronotum wider than head and a little wider than long, widest at about six-sevenths from base, and almost straightly narrowed posteriad towards ante-basal sinuation of sides; PW/HW 1.30-1.38 (M 1.33), PW/PL 1.03-1.10 (M 1.06), PW/PA 1.29-1.34 (M 1.32), PW/PB 1.66-1.76 (M 1.71); sides rather widely reflexed near front angles, very narrowly bordered at middle, and moderately reflexed in basal area, briefly but strongly rounded in front, either straight or slightly emarginate at middle, shallowly sinuate at about basal sixth, and then more or less divergent towards hind angles, which are acute and postero-laterally protrudent; apex much wider than base, nearly straight or slightly bisinuate, PA/PB 1.25-1.35 (M 1.29), with front angles produced forwards and rounded at the external sides together with anteriormost portions of lateral margins; base slightly emarginate at middle and slightly sinuate on each side inside hind angle;

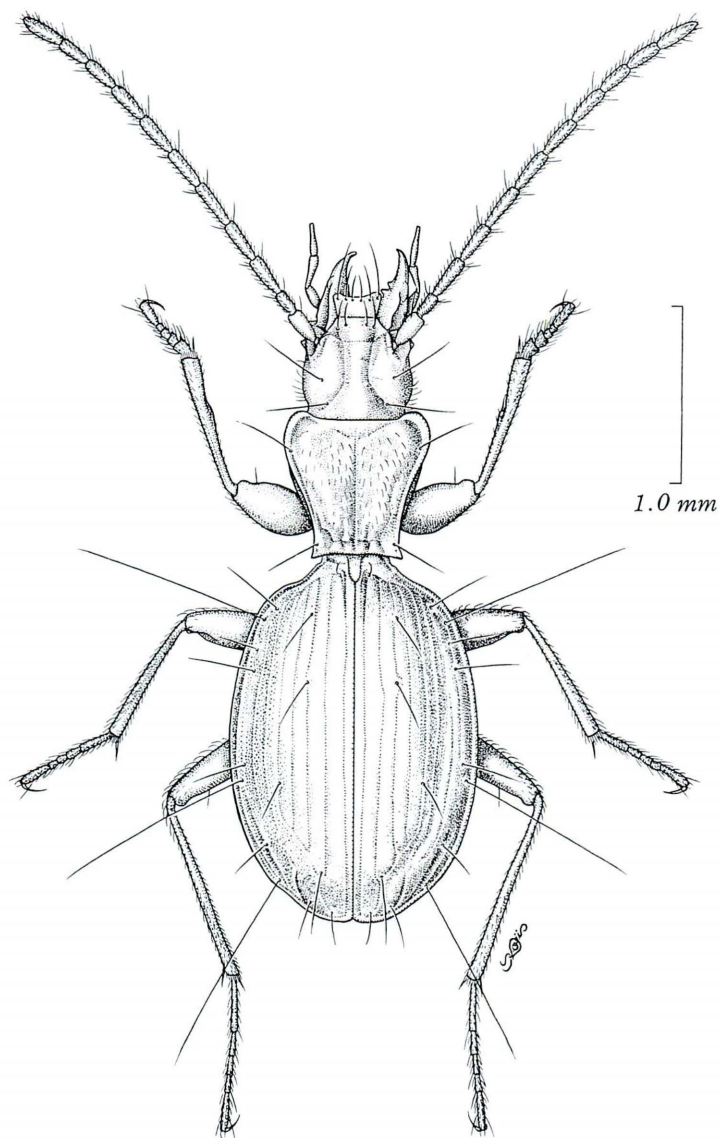


Fig. 1. *Yamautidius* (s. str.) *crosos* S. UENO et NAITÔ, sp. nov., ♂, from Kuki in Nishitosa-mura.

basal area narrow, with small basal foveae. Lateral expansion of propleura narrowly but clearly visible from above.

Elytra ovate and ample, much wider than pronotum, widest at about middle, and almost equally narrowed towards bases and towards apices; EW/PW 1.67–1.72 (M 1.69), EL/PL 2.53–2.59 (M 2.56), EL/EW 1.39–1.45 (M 1.42); shoulders distinct

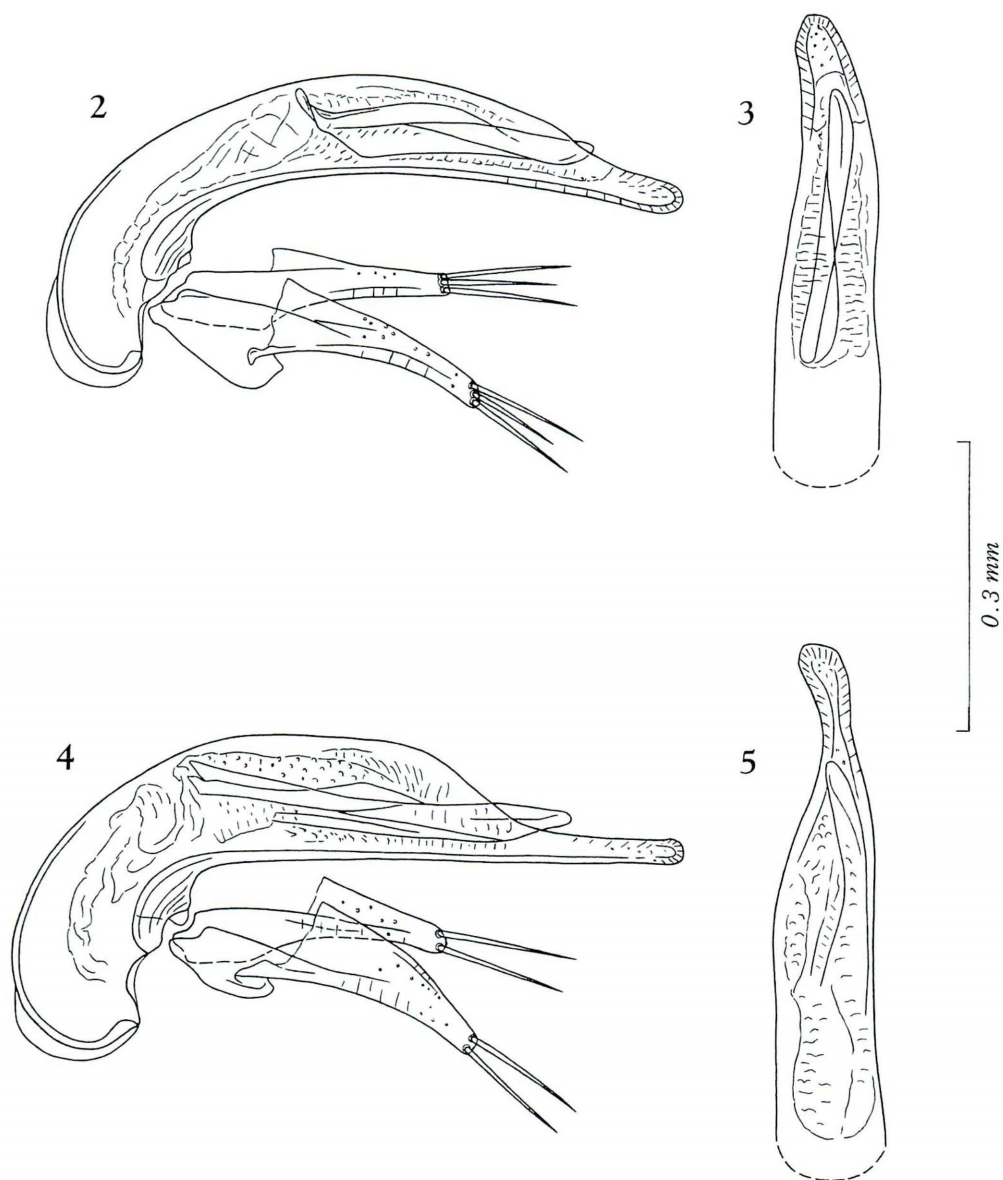
though rounded; prehumeral borders moderately oblique and slightly emarginate, becoming much finer towards basal peduncle but complete to the base of stria 5, and devoid of basal tubercles; sides narrowly bordered, gently arcuate at middle, and rather widely rounded at apices without appreciable preapical emargination, forming a small re-entrant angle at suture; dorsum moderately convex though widely depressed on the disc in basal third; striae superficial and smooth, striae 1–5 more or less deepened in basal depression, 6–7 fine, 8 moderately impressed behind the middle set of marginal umbilicate pores; apical striole clearly impressed, free at the anterior end though directed to stria 5; stria 3 with two setiferous dorsal pores at $1/7$ – $1/6$ and about $1/3$ from base, respectively, stria 5 with a single setiferous dorsal pore at about $3/5$ from base; preapical pore located behind the level of the terminus of apical striole, and more distant from apex than from suture. Legs ordinary for a member of *Yamautidius*.

Male genital organ rather lightly sclerotized, basically similar to that of *Y. uozumii* but markedly different in configuration of aedeagal apical lobe and of copulatory piece, the latter of which resembles that of *Y. eos* S. UÉNO (1982, pp. 13, 38, figs. 32–33) from Hoshigataki-no-iwaya Cave at Yokokura-yama. Aedeagus one-third as long as elytra, tubular, slender, and gently arcuate, with small basal part and relatively short apical lobe; basal part moderately curved ventrad, shallowly emarginate at the sides of small basal orifice, and with hyaline sagittal aileron; viewed laterally, apical lobe fairly short, straight, parallel-sided, and narrowly rounded at the extremity; viewed dorsally, apical lobe lightly curved to the right, gradually narrowed apicad, and blunt at the extremity; ventral margin shallowly emarginate before middle in profile. Inner sac scaly though the scales are not sclerotized; copulatory piece nearly a half as long as aedeagus, twisted, fairly broad in proximal three-fifths but becoming narrower apically, and blunt at the apex. Styles with narrow apical parts, left style obviously longer than the right, each bearing three apical setae.

Type series. Holotype: ♂, allotype: ♀ (found dead); paratypes: 2♂♂, 3♀♀ (all found dead), 4–V–2006, T. NAITÔ leg.; 1♀ (teneral), 26–VIII–2006, T. NAITÔ leg. All deposited in the collection of the Department of Zoology, National Science Museum (Nat. Hist.), Tokyo.

Type locality. Kuki, 290 m in altitude, in Nishitosa-mura of Kôchi Prefecture, southwestern Shikoku, Southwest Japan.

Notes. It was most unexpected that the male genitalia of *Y. croson* resemble in many respects those of *Y. eos* occurring at the eastern periphery of the range of generic distribution (cf. No. 13 on fig. 55, in UÉNO, 1982, p. 63), about 68 km distant to the northeast in a beeline from the type locality of the present species. In external morphology, however, *Y. croson* is similar to *Y. uozumii*, whose type locality is about 21 km distant to the north-northeast in a beeline. It is probable that parallel modification of aedeagal inner armature took place between the component species of the *uozumii* complex and of the *eos* complex, resulting in formation of closely similar copulatory sclerites in two remotely related species. This inference is also supported by the close similarity of copulatory sclerites between *Y. sucmo* (to be described on the following



Figs. 2-5. Male genitalia of *Yamautidius* spp.; left lateral view (2, 4), and apical part of aedeagus, dorso-apical view (3, 5). — 2-3. *Y. croson* S. UÉNO et NAITÔ, sp. nov., from Kuki in Nishitosa-mura. — 4-5. *Y. sucmo* S. UÉNO et NAITÔ, sp. nov., from the Shimo-no-tani at Shimosuka in Sukumo-shi.

pages) and *Y. basisquamatus*, the former belonging to the *uozumii* complex and the latter to the *eos* complex. The type locality of the latter is about 70 km distant to the north-northeast in a beeline from that of the former.

The type specimens of *Y. croson* were found on the northern slope of the Hokê-gamori Ridge, the main southeastward branch of the Uwa Hills. All the specimens were dug out from a scree deposited in a gully about 300 m below the watershed. Unfortunately, only one mature male was collected alive; all the others were infected with fungi and found dead, though the allotype is in a fair condition.

The specific name "*croson*" is derived from a Latinized spelling of Kuroson, since the type locality belongs to the Kuroson-gawa drainage area well known to Japanese entomologists as a good collecting site of various insects.

Yamautidius (s. str.) *sucmo* S. UÉNO et NAITÔ, sp. nov.

(Figs. 4–5)

Length: 3.35–3.70 mm (from apical margin of clypeus to apices of elytra).

Externally very close to *Y. croson*, but distinguished from it by narrower elytra. Strikingly different from *Y. croson* in configuration of male genitalia including copulatory piece.

Colour and microsculpture as in *Y. croson*. Head and pronotum practically identical with those of *Y. croson*; PW/HW 1.25–1.31, PW/PL 1.06–1.12, PW/PA 1.27–1.31, PW/PB 1.65–1.73, PA/PB 1.29–1.32. Elytra obviously narrower than in *Y. croson*; EW/PW 1.60–1.64, EL/PL 2.73, EL/EW 1.52–1.58; basal parts as in *Y. croson*; sides more feebly arcuate at middle and more narrowly rounded at apices than in *Y. croson*; striation and chaetotaxy as in *Y. croson*.

Male genital organ relatively large though lightly sclerotized, basically similar to that of *Y. croson* but strikingly different in configuration of aedeagal apical lobe and of copulatory piece, the latter of which resembles that of *Y. basisquamatus* S. UÉNO (1982, pp. 13, 41, figs. 36–37) from Tashiro-no-anagami Pothole at Nakatsu of Yanadani-mura. Aedeagus about two-fifths as long as elytra, gently compressed, hardly arcuate at middle, with ventrally curved basal part and long apical lobe; basal part fairly elongate, strongly curved ventrad, with small basal orifice deeply emarginate at the sides; sagittal aileron narrow and hyaline; viewed dorsally, apical part gradually narrowed into a long apical lobe, which is inclined to the right and dilated into a subpentagonal terminal portion; viewed laterally, apical lobe narrow, parallel-sided, and blunt at the extremity; ventral margin nearly straight in profile. Inner sac scaly, though the scales are not sclerotized and do not form any teeth-patch; copulatory piece very large and elongate, four-sevenths as long as aedeagus, longitudinally duplicate, and twisted from ventro-proximal to dorso-apical parts, with narrowly rounded apex. Styles narrowed towards apices, left style obviously larger than the right, each bearing two or three apical setae.

Female unknown.

Type series. Holotype: ♂, paratype: 1♂, 5–V–2006, T. NAITÔ leg. Deposited in

the collection of the Department of Zoology, National Science Museum (Nat. Hist.), Tokyo.

Type locality. Shimo-no-tani, 150 m in altitude, at Shimosuka of Sukumo-shi in Kôchi Prefecture, southwestern Shikoku, Southwest Japan.

Further specimen examined. 1♂, Kôzu, 150 m alt., Sukumo-shi, Kôchi Pref., 20-V-2006, T. NAITÔ leg. (NSMT).

Notes. This is an interesting species very closely similar to *Y. croson* in external morphology but incredibly different from it in genitalic features. Its type locality is only 9.2 km distant to the south-southwest in a beeline from that of *Y. croson*, though lying near the southeastern foot of the Sasa-yama Ridge stretching on the other side of the Matsuda-gawa Valley. The two specimens of the type series were found in a clayey deposit of mudstone and sandstone gravel at a depth of about 60 cm.

The single male specimen taken at Kôzu (3.40 mm in the length of body) perfectly agrees with the type series with the exception of the aedeagal apical lobe, whose terminal portion is gently decurved. This is, however, regarded as an individual variation. The standard ratios in this specimen are as follows: PW/HW 1.36, PW/PL 1.14, PW/PA 1.30, PW/PB 1.82, PA/PB 1.40, EW/PW 1.56, EL/PL 2.70, EL/EW 1.52.

Kôzu is a small village lying on the same hill 3.8 km southeast from the type locality of *Y. sucmo*. The single specimen known was dug out from a deposit of fairly large flakes of shale at the side of a forestry road.

The specific name "*sucmo*" is derived from a Latinized spelling of Sukumo, the southernmost known locality of *Yamautidius*.

要 約

上野俊一・内藤隆夫：四国南西部で発見された地下浅層性のケムネメクラチビゴミムシ。——四国南西部の宇和山地を中心とする地域からは、これまで無数のチビゴミムシ類がまったく知られていなかった。しかし今年の春になって、この地域の南東部の3カ所で、地下浅層性のケムネメクラチビゴミムシが発見され、検討の結果、アリノキメクラチビゴミムシ系列の2新種に分類されることが判ったので、クロソンメクラチビゴミムシ *Yamautidius croson* S. UENO et NAITÔ およびスクモメクラチビゴミムシ *Y. sucmo* S. UENO et NAITÔ という新名を与えてこの論文に記載した。ケムネメクラチビゴミムシ亜属の既知種は22種知られているが、いずれも石灰洞か鉱山の坑道から見つかったもので、地下浅層性の種は今回はじめて報告されることになる。生物地理学的に重要な分布の空白域からの発見であるとともに、洞窟生物学的にも重要な新発見である。

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The Staphylinid Beetles (Coleoptera) Newly Recorded from the Island of Tosa-okinoshima in Kôchi Prefecture, Japan

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Only one species, *Stenaesthetus sunioides* SHARP, has hitherto been reported by WATANABE (2005, p. 640) from the Island of Tosa-okinoshima in Kôchi Prefecture. Examining the staphylinid beetles deposited in the collection of the Laboratory of Insect Resources, Tokyo University of Agriculture, I have found three unrecorded species from this island. They are recorded below with the collecting data.

1. *Isocheilus staphylinoides* (KRAATZ)
1♂, 28-VI-1955, Y. WATANABE leg.
2. *Scopaeus virilis* SHARP
3♂♂, 1♀, 28-VI-1955, Y. WATANABE leg.
3. *Philonthus* (s. str.) *gastralis* SHARP
1♀, 29-VI-1955, Y. WATANABE leg.

Reference

WATANABE, Y., 2005. Occurrence of *Stenaesthetus sunioides* SHARP (Coleoptera, Staphylinidae) from the Island of Tosa-okinoshima off southwestern Shikoku, Japan. *Elytra*, Tokyo, 33: 640.